

NEW RECORDS AND NOTES ON SPECIES FROM PARC NATIONAL
PIC MACAYA, MASSIF DE LA HOTTE, HAITI, INCLUDING
A NEW SPECIES OF *PILEA* (URTICACEAE)

Lucas C. Majure

Department of Biology
University of Florida
Gainesville, Florida 32611-8525, U.S.A.
lmajure@ufl.edu

J. Dan Skean, Jr.

Department of Biology
Albion College
Albion, Michigan 49224, U.S.A.
dskean@albion.edu

Gretchen M. Ionta¹

Department of Biology
University of Florida
Gainesville, Florida 32611-8525, U.S.A.
gionta@ufl.edu

Walter S. Judd

Department of Biology
University of Florida
Gainesville, Florida 32611-8525, U.S.A.
wjudd@botany.ufl.edu

ABSTRACT

Nineteen species new to the flora of the Macaya Biosphere Reserve (including Parc National Pic Macaya) are reported, along with notes on five additional species. The Hispaniolan endemic *Cyperus picardae* is reported as new to the Massif de la Hotte, and a new species of *Pilea*, *P. vermicularis* (Urticaceae), from the Massif de la Hotte, is described and illustrated.

KEY WORDS: Haiti, Macaya Biosphere Reserve, Massif de la Hotte, *Pilea*

RESUMEN

Se reportan diecinueve especies nuevas de flora de la Reserva Biósfera Macaya (incluyendo Parc National Pic Macaya) y añadimos notas sobre cinco especies adicionales. La endémica de La Española, *Cyperus picardae*, es reportada como nueva para el Massif de la Hotte, y una nueva especie de *Pilea*, *P. vermicularis* (Urticaceae), del Massif de la Hotte, se describe e ilustra.

PALABRAS CLAVES: Haití, Reserva de la Biósfera Macaya, Masizo de la Hotte, *Pilea*

Parc National Pic Macaya is located near Ville Formon in the Massif de la Hotte, ca. 36 km northwest of Les Cayes, Haiti, encompassing ca. 2000 hectares (Judd 1987; Woods et al. 1992). The flora, plant communities, land-use patterns, and history of biological exploration in the region are outlined in Judd (1987), Judd et al. (1990, 1998), Woods and Ottenwalder (1992), Woods et al. (1992), and Sergile et al. (1992). The majority of Haiti's remaining undegraded natural forest lies within the boundaries of Parc National Pic Macaya and the country's other national park, Parc National Morne La Visite, in southeast Haiti. Parc National Pic Macaya provides refuge for numerous endemic species (Woods et al. 1992, Rimmer et al. 2005, Huber et al. 2010), and is the watershed for the agricultural region of the Plain of Les Cayes to the south (Woods et al. 1992). In 1987 the government of Haiti established the ca. 16,000 hectare Pic Macaya Biosphere Reserve, with the goal of protecting and rehabilitating the biologically diverse forests of Pic Macaya National Park while fostering sustainable development of the surrounding buffer zone (Sergile et al. 1992). For a map of Parc National Pic Macaya, see Judd (1987).

Below we list species newly documented as occurring in Parc National Pic Macaya, along with previously documented species for which we provide additional information based on recent observations. Most of these records are based on collections made by the first three authors (L.C. Majure, G.M. Ionta, and J.D. Skean, Jr.) during field work in the region in January, 2013. However, a few species are listed based on reconsideration of earlier collections made by J.D. Skean or W.S. Judd. The taxa are listed in alphabetical order by family with entries following the format of Judd et al. (1990, 1998). A complete set of voucher specimens is deposited at the

¹Department of Biology, Gordon State College, Barnesville, Georgia, 30204, U.S.A. Email: gionta@gordonstate.edu

herbarium of the University of Florida, Gainesville (FLAS). A second set comprised of the collections made in 2013 is deposited with William Cinea at the American University of Les Cayes, and additional duplicates will be distributed. Taxa endemic to Hispaniola (*) or the Massif de la Hotte (+) are indicated.

Asteraceae

* **Mikania polychaeta** Urb.; vine, occasional; opening in forest dominated by *Pinus occidentalis* Sw., associated with *Gleichenia* sp., *Miconia subcompressa* Urb., *M. umbellata* (Mill.) Judd & Ionta, *Piper* sp., *Renalmia jamaicensis* (Gaertn.) Horaninow, and *Rhytidophyllum auriculatum* Hook., 1466 m. This species is a new record for Parc National Pic Macaya.

Voucher specimen: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, S slopes of Morne Formon, Pic Le Ciel, 18.34584°N, 74.02220°W, 10 Jan 2013, L.C. Majure 4309 (FLAS).

Begoniaceae

* **Begonia** cf. **bolleana** Urb. & Ekman; herb, uncommon; disturbed rak bwa (i.e., moist broadleaved forest over karstic limestone) in mostly cleared forest, associated with *Miconia navifolia* Ionta, Judd, & Skean, ca. 900 m. This species is a new record for the Macaya Biosphere Reserve.

Voucher specimen: **HAITI. Département du Sud:** Massif de la Hotte, Soulet, Formon trail between Sou Bwa and Les Platons, karst hills, 18.29365°N, 73.99418°W, 15 Jan 2013, L.C. Majure 4318 (FLAS).

Cyperaceae

* **Cyperus picardae** Boeck. var. **brevinix** Kük.; herb, uncommon; growing out of heavy, disturbed, limestone soils, in cleared forest, associated with *Bactris plumeriana* Mart., *Bunchosia haitiensis* Urb. & Niedz., *Calycogonium hispidulum* Cogn., *Miconia curvipila* (Urb. & Ekman) Ionta, Judd, & Skean, *Miconia laevigata* (L.) DC., *Mecranium multiflorum* (Desr.) Triana, *Neea demissa* Heimerl, *Smilax havanensis* Jacq., and *Tabebuia berteri* (DC.) Britt., 728 m. Although *C. picardae* var. *brevinix* was collected outside of the Parc National Pic Macaya, this species was previously only known from the Massif de la Selle in eastern Haiti. This collection represents a significant range extension of the species to the west and the first collection of the species from the Massif de la Hotte.

Voucher specimens: **HAITI. Département du Nippes (formerly Grand' Anse):** Massif de la Hotte, Morne Salagnac, ca. 14.8 km SW of Miragoane, 7.2 km S of Petite-Rivière de Nippes and 4 km W of Bois Cabrit, 18.411072°N, 73.225369°W, 17 Jan 2013, L.C. Majure 4322 (FLAS, NY, VAL).

* **Rhynchospora domingensis** Urb.; herb, uncommon; moist, rich slopes in heavy soils of cloud forest dominated by *Pinus occidentalis*, *Alsophyllus* sp., *Brunellia comocladifolia* Humb. & Bonpl., and *Cyathea* sp., also associated with *Mecranium microdyctium* Urb. & Ekman, *Miconia xenotricha* Urb. & Ekman, and *Rhynchospora elongata* Boeck. var. *ekmanii* (Urb.) Kük., ca. 1878 m. This species is a new record for Parc National Pic Macaya.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, S slopes of Morne Formon, 18.35160°N, 74.021290°W, 13 Jan 2013, L.C. Majure 4307 (FLAS, NY).

Melastomataceae

+ **Calycogonium ekmanii** Urb.; small tree 2.5 m, rare, a single sterile individual; in rak bwa; 998 m. This species was collected in an extremely disturbed area growing in patches of cut-over forest with *Illicium hottense* A. Guerrero, Judd & A.B. Morris, *Meriania brevipedunculata* Judd & Skean, *Miconia (Sagraea) polychaete* (Urb. & Ekman) Ionta, Judd, & Skean, *M. pyramidalis* (Desr.) DC., and *M. subcompressa*. This collection is a new record for Parc National Pic Macaya.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, S edge of Ravine Casco in sight of the waterfall, 18.32931°N, 74.00191, 9 Jan 2013, J.D. Skean, Jr. 5045 (FLAS, NY).

+ **Calycogonium formonense** Judd, Skean & Clase; shrub to 1.5 m, rare; in rak bwa, see Judd et al. (2008) for list of associates, 950–1200 m. Specimens initially identified and reported by Judd (1978) as *C. cf. calycopteris*

(Rich.) Urb. and later as *C. hispidulum* (Judd et al. 1998) were later recognized as representing a new species, *C. formonense*, which is endemic to the Massif de la Hotte, and likely to the Macaya Biosphere Reserve (see Judd et al. 2008). *Calycogonium* is polyphyletic (Michelangeli et al. 2008) and this species (along with its relatives) is being transferred to *Miconia* (Judd et al., in press).

Voucher specimens: see Judd et al. (2008).

+ **Henriettea hotteana** (Urb. & Ekman) Alain; shrub ca. 2 m tall, rare, mixed pine/cloud forest with *Arthrostylidium haitiense* (Pilger) Hitchc. & Chase, *Calyptranthes hotteana* Urb. & Ekman, *Alsophila* sp., *Weinmannia pinnata* L., *Phoradendron* sp., 2219 m. This species is a new record for Parc National Pic Macaya.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, along trail of Pic Formon, 18.35782°N, 74.02687°W, G.M. Ionta 2031 (FLAS, NY).

+ **Mecranium** sp.; or small tree to 4.5 m tall in rak bwa, uncommon, 979–1188 m. This entity, previously known from a single earlier collection, i.e., Skean 2093 (FLAS, IJ, S, US), was considered by Skean (1993) to be a putative hybrid between *Mecranium haitiense* Urb. and *M. revolutum* Skean & Judd. Our additional collections indicate that this entity is much more widespread in the Formon region than previously thought, and it may represent an undescribed species. All collections have been sterile and found in areas where *M. haitiense* and *M. revolutum* are common. The plants commonly have red, scurfy abrasions apparently caused by some type of pathogen; the material is currently under study by J. Dan Skean, Jr.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, Deron Plain; rak bwa above/behind Kay Michele Aubrey "Experiment Station," 18.33143°N, 74.00317°W, 14 Jan 2013, G.M. Ionta 2046 (FLAS); Bwa Deron, W of Ville Formon, growing out of rak bwa, 18.32648°N, 74.020090°W, 14 Jan 2013, L.C. Majure 4312 (FLAS); Bwa Formon, S of Morne Formon, along road from Sou Bwa to Ville Formon, karst hills, 18.31878°N, 74.00922°W, 8 Jan 2013, J.D. Skean, Jr. 5037 (FLAS, NY); near the crest along the Sou Bwa–Ville Formon road, 18.31334°N, 74.01174°W, J.D. Skean, Jr. 5039 (FLAS, NY); S edge of Ravine Seche above region called Ravine Casco ca. 0.5 km uphill from the waterfall, 18.33519°N, 74.01248°W, 9 Jan 2013, J.D. Skean, Jr. 5043 (FLAS, NY).

+ **Meriania ekmanii** Urb.; large shrub to 4.5 m tall, occasional; rak bwa in moist, broadleaf forest or cloud forest dominated by *Pinus occidentalis* Sw., *Gleichenia bifida* (Willd.) Spreng., and *G. revoluta* H.B.K., associated with *Alsophila* sp., *Blechnum* sp., *Brunellia comocladifolia* Bonpl., *Didymopanax tremulum* Krug & Urb., and *Weinmannia pinnata* L.; 1170–1885 m. This species is a new record for Parc National Pic Macaya and was previously known only from the type specimen.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, along the saddle from Morne Formon to Pic Macaya and at the base of trail leading to Pic Macaya, 18.379223°N, 74.027207°W, 12 Jan 2013, L.C. Majure 4299 (FLAS, NY; Fig. 1); Pic Le Ciel, 18.35512°N, 74.01967°W 12 Jan 2013, J.D. Skean, Jr. 5054 (FLAS); rak bwa between Ville Formon and Experiment Station on Deron Plain, 14 Nov 1989, W.S. Judd 5852 (FLAS).

+ **Miconia** sp. This taxon was erroneously reported in Judd (1987) as "*Pachyanthus hotteana*," an unpublished name, based on the collections Judd 3939 and Skean 2080. It was recollected (Ionta 2023, FLAS) on our 2013 trip and is currently under study.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, Bwa Formon, disturbed rak bwa just S of Ville Formon, 18.31483°N, 74.00946°W, 8 Jan 2013, G.M. Ionta 2023 (FLAS, NY); Bwa Formon, moist forest on limestone (rak bwa) on hills in vicinity of Ville Formon, 1 Feb 1984, W.S. Judd 3939 (FLAS); disturbed raw bwa ca. 0.5 km on the Morne Formon side of Sou Bwa (trail between Ville Formon & Sou Bwa), 1 Jan 1987, J.D. Skean, Jr. 2080 (FLAS).

+ **Miconia barkeri** Urb. & Ekman. While preparing specimens of this species (of sect. *Chaenopleura*; see Judd 2007) during the January 2013 collecting trip, a distinct odor of cinnamon emanating from the leaves and inflorescences was noted during the drying process. We subsequently detected a faint cinnamon odor on previously collected herbarium material of this species housed at FLAS. Thus we report this curious finding, which has not been previously noted.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, along trail of Morne Formon, Pic Formon, 18.35798°N, 74.02677°W, 11 Jan 2013, G.M. Ionta 2028 (FLAS, NY). Additional specimens from the Parc National Pic Macaya are cited in Judd (2007).



FIG. 1. **A)** fruiting branch of *Meriania ekmanii* (Majure 4299), **B–C)** habit, immature fruit, and flowers of *Miconia barkeri* (Ionta 2028). Photos A and C taken by G.M. Ionta and B taken by L.C. Majure.

+ **Miconia cordieri** Ionta & Judd; shrub to 1.5 m, uncommon; in disturbed rak bwa, 950–1200 m. This recently described species (of sect. *Sagraea*; see Ionta et al. 2012) is endemic to the Macaya Biosphere Reserve (Ionta & Judd 2012). It was initially reported by Judd (1987) as *Ossaea curvipila* Urb. & Ekman (based on W.J. Judd 3469).

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte: Bois Formon, S of village of Formon, S of Morne Formon, 950–1040 m, 23 Jan 1984, W.S. Judd & D. Dod 3469 (FLAS, EHH, NY); between Ville Formon and “Experiment Station” on Deron Plain, 1170–1190 m, 14 Nov 1989, W.S. Judd 5859 (FLAS, 2 sheets).

+ **Miconia curvipila** (Urb. & Ekman) Ionta, Judd, & Skean; shrub to 1.5 m, common; in disturbed rak bwa, 915–1000 m. The report of this species was based upon the specimen Judd 3469, which actually represents *M. cordieri*, although Skean 1320 (see specimen cited below), which actually represents this species, was initially reported as *Ossaea setulosa* Urb., now *Miconia rubrisetulosa* Ionta, Judd & Skean (Ionta et al. 2012; Judd 1987).

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte: karst hills just S of Sou Bwa, along road to Parc National Pic Macaya and Ville Formon, 950 m, 9 Jun 1993, W.S. Judd 6892 (EHH, FLAS); Macaya Biosphere Reserve, Bwa Formon, disturbed “rak bwa” and fields ca. 2 km SW of home of Robert and Tila Despagne, our base camp at Ville Formon, 915–945 m, 4 Jan 1984, J.D. Skean 1320 (EHH, FLAS); Bwa Formon, karst hills ca. 1 mi S of Ville Formon, 950–1000 m, J.D. Skean Jr. & C. McMullen 2465 (FLAS, MICH); Between Sou Bwa and Les Platons, karst hills, 18°17'19.9"N, 73°59'28.1"W, 7 Jan 2013, G.M. Ionta 2012 (FLAS, NY); Soulet, Between Sou Bwa and Les Platons, karst hills (disturbed rak bwa), 18.29623°N, 73.99812°W, 15 Jan 2013, G.M. Ionta 2050 (FLAS, NY); Macaya Biosphere Reserve, Soulet, karst hills along Formon trail between Sou Bwa and Les Platons, 18.29413°N, 73.99434°W, 15 Jan 2013, G.M. Ionta 2053 (FLAS, NY); Macaya Biosphere Reserve, Bwa Clé, disturbed rak bwa off of Formon trail, 18.28198°N, 73.98831°W, 15 Jan 2013, G.M. Ionta 2055 (FLAS, NY); Macaya Biosphere Reserve, Soulet, karst hills along Formon trail between Sou Bwa and Les Platons, 18.29413°N, 73.99434°W, 15 Jan 2013, L.C. Majure 4316 (FLAS, NY).

+ **Miconia hottensis** Ionta, Judd & Skean; shrub to 3 m, occasional; in disturbed rak bwa, 1100–1200 m. This species (of sect. *Sagraea*), endemic to the Macaya Biosphere Reserve, was recently described by Ionta et al. (2012). Until our recent collections, it was known from only two collections.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte: Bwa Formon, near Nan Selle at Ravine Casco, in sight of the waterfall, 1100–1200 m, 13 Aug 1989, J.D. Skean, Jr. & C. McMullen 2557 (FLAS, JBSD, MICH, NY, S); Soulet, between Sou Bwa and Les Platons, karst hills (disturbed rak bwa), 18.29623°N, 73.99812°W, 15 Jan 2013, G.M. Ionta 2052 (FLAS, NY).

+ **Miconia navifolia** Ionta, Judd & Skean; shrub to 2 m tall, occasional; in disturbed rak bwa, 1100–1200 m. This species (of sect. *Sagraea*) is an endemic to the Macaya Biosphere Reserve and was only recently described (Ionta et al. 2012). Until our recent collections, it was only known from two collections.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte: Macaya Biosphere Reserve, Bwa Formon, near Nan Selle at Ravine Casco, in sight of the waterfall, 1100 m, 11 Aug 1989, J.D. Skean, Jr. & C. McMullen 2526 (FLAS, JBSD, MICH, NY, S: Type); *ibid*, 1100–1200 m, 13 Aug 1989, J.D. Skean, Jr. & C. McMullen 2540 (FLAS, MICH); Between Sou Bwa and Les Platons, karst hills, 18°17'19.9"N, 73°59'28.1"W, 7 Jan 2013, G.M. Ionta 2011 (FLAS, NY); Soulet, between Sou Bwa and Les Platons, karst hills (disturbed rak bwa), 18.29623°N, 73.99812°W, 15 Jan 2013, G.M. Ionta 2051 (FLAS, NY); Soulet, karst hills along Formon trail between Sou Bwa and Les Platons, 18.29365°N, 73.99418°W, 15 Jan 2013, G.M. Ionta 2054 (FLAS, NY); Soulet, karst hills along Formon trail between Sou Bwa and Les Platons, 18.29365°N, 73.99418°W, 15 Jan 2013, L.C. Majure 4317 (FLAS).

+ **Miconia polychaete** (Urb. & Ekman) Ionta, Judd & Skean (see Ionta et al. 2012); shrub to 1 m tall, uncommon; in disturbed rak bwa, 1017–1100 m. This species (of sect. *Sagraea*) is a new record for the Macaya Biosphere Reserve and previously was known only from the type specimen. Associated taxa include *Andropogon bicornis* L., *Cestrum bicolor* Urb., *Gleichenia* sp., *Lantana* sp., *Meriania brevipedunculata* Judd & Skean, *Miconia pyramidalis*, *M. subcompressa*, *Ocotea* sp., *Paspalum* sp., *Smilax havanensis*, *Tabebuia berteri*, and *Vernonia saepium* Ekm.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte: Macaya Biosphere Reserve, Bwa Formon, N slopes of Ravine Casco, in view of the waterfall, 1017 m; 18.32969°N, 74.00246°W, 9 Jan 2013, G.M. Ionta 2025 (FLAS, NY); near Nan Selle at Ravine Casco, in sight of the waterfall, 1100 m, 11 Aug 1989, J.D. Skean, Jr. & C. McMullen 2727 (FLAS, MICH, NY).

Myrtaceae

+ **Calyptranthes ekmanii** (Urb.) Burret; small tree to 3 m tall with purple-black fruits, uncommon, 1185 m. This species is a new record for Parc National Pic Macaya.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, Deron Plain; rak bwa above/behind Kay Michele Aubrey "Experiment Station," 18.33143°N, 74.00317°W, 14 Jan 2013, J.D. Skean, Jr. 5061 (FLAS, NY).

+ **Hottea torbeciana** Urb. & Ekman; shrub, to 2 m tall, uncommon, ca. 1200 m. This species is a new record for Parc National Pic Macaya.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, Deron Plain; rak bwa above/behind Kay Michele Aubrey "Experiment Station," 18.33143°N, 74.00317°W, 14 Jan 2013, G.M. Ionta 2047 (FLAS, NY).

Poaceae

Dichanthelium aff. **dichotomum** (L.) Gould; herb, rare; forming small colonies in disturbed limestone soils (from landslide) along the edge of forest dominated by *Pinus occidentalis*, and associated with *Miconia umbellata*, *Pilea microphylla* (L.) Liebm., 1466 m. *Dichanthelium* was not previously recorded for Parc National Pic Macaya. This collection is not typical of *D. dichotomum* due to its densely pubescent leaf surfaces and sheaths, small leaves ($0.7\text{--}1.5 \times 0.09\text{--}0.27$ cm), lack of a basal rosette and spreading, colonial growth form.

Voucher specimen: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, S slopes of Morne Formon, just N of spring, Pic Le Ciel, 18.34651°N, 74.02151°W, 10 Jan 2013, L.C. Majure 4310 (FLAS).

Polygalaceae

* **Badiera subrhombifolia** Abbott; shrub to small tree to 7 m; in rak bwa, common, 950–1050 m. Previously reported by Judd (1987) as *Polygala penaea* L.; the populations of *P. penaea*-like plants occurring in the Macaya Biosphere Reserve, the Massif de la Selle, and the Sierra de Bahoruco have been segregated and described as *Badiera subrhombifolia* (Abbott & Judd 2011).

Voucher specimens: see Abbott and Judd (2011).

Schisandraceae

+ **Illicium hottense** A. Guerrero, Judd & A.B. Morris (Fig. 2); shrub to small tree to 4 m, common; in rak bwa and moist forests of *Pinus occidentalis*, long unburned, showing transition to cloud forest, 750–1560 m. Previously reported by Judd (1987) as *Illicium ekmanii* A.C. Smith, but the populations of *Illicium ekmanii* in the Massif de la Hotte have been segregated and described as *I. hottense* (Guerrero et al. 2004). DNA sequence data supports the sister-group relationship of *Illicium hottense* and *I. ekmanii* A.C. Smith, the latter a species occurring in the Massif du Nord, Haiti, and the Cordillera Central and Cordillera Septentrional of the Dominican Republic (Guerrero et al. 2004). *Illicium* has also been collected in the Massif de la Selle (*Ekman* H2230 (S), from Morne l'Hopital, the type of *I. ekmanii* subsp. *selleanum* Imkhanitskaya); however, the specimen *Ekman* H2230 has no flowers (although fruits are present) and therefore cannot be identified with certainty. It is the most papillate of all Hispaniolan *Illicium* – having papillate stems and young petioles and even fruiting pedicels. *Ekman* H2230 may represent an undescribed species related to *Illicium hottense*, but flowering material is required for a definitive conclusion.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, Bwa Formon, rak bwa just S of Ville Formon, 18°19'43.2"N, 73°59'41.5"W, 8 Jan 2013, L.C. Majure 4280 (FLAS, NY); see also Guerrero et al. (2004).

Solanaceae

Acnistus arborescens (L.) Schlecht.; shrub to 2 m tall, rare; rocky (limestone) soils along ephemeral stream, associated with, *Gyrotaenia myriocarpa* Griseb., *Lobelia robusta* Graham, *Senecio stenodon* Urb., *Tibouchina longifolia* (Vahl) Baill., and *Thelypteris* sp.; ca. 1400 m. Hunziker (1982) considered the genus *Acnistus* to be monotypic consisting only of *A. arborescens*, which is widespread throughout the Neotropics. Smith and Baum (2008) showed that *A. arborescens* is deeply nested, however, within the genus *Lochroma*, and they discussed the lack of morphological characters to separate the two genera. Although the phylogenetic analysis of Smith and Baum (2008) indicated that *Lochroma* is not monophyletic, they recovered two clades, one of which contained the type species for the genus, *I. cyanea*. *Acnistus arborescens* is nested within the clade containing the type of the genus; however, *Acnistus* is the older name, thus a proposal for the conservation of the species-rich and horticulturally important genus *Lochroma* is necessary before the nomenclatural transfer can be made.



FIG. 2. A) Flower, and B) fruiting branch of *Illicium hottense*. Photos taken by L.C. Majure.

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, S slopes of Morne Formon, above Ravine Fond Bleu; N of Ville Formon, 11 Nov 1989, W.S. Judd 5748 (FLAS); S slopes of Morne Formon, ravine leading to Morne Formon Trail, along ephemeral stream, 18.34201°N, 74.02126°W, 13 Jan 2013, L.C. Majure 4302 (FLAS, NY).

+ *Cestrum hotteanum* Urb. & Ekman; shrub to 1 m tall, common, 933 m. Material originally identified as *C. hotteanum* from the Pic Macaya Reserve (see Judd, 1987) is referable to *Acnistus arborescens* (i.e., W.S. Judd 5748). Thus *C. hotteanum* is reported here for the first time from Parc National Pic Macaya.

Voucher specimen: **HAITI. Département du Sud:** Massif de la Hotte, Parc National Pic Macaya, Bwa Formon, rak bwa just S of Ville Formon, 18°19'43.2"N, 73°59'41.5"W, 8 Jan 2013, G.M. Ionta 2022 (FLAS).

Urticaceae

The genus *Pilea*, the largest in the Urticaceae, comprises ca. 715 species (Monro 2004) of which approximately 235 occur in the Neotropics (Monro 2006). The Greater Antilles is one of the major centers of diversity of the clade (Monro 2009). *Pilea* is especially diverse on Hispaniola, with nearly 100 species found there (Liogier 1996; Moscoso 1943). To date, 14 species of *Pilea* have been recorded in Parc National Pic Macaya (Judd 1987), including *P. howardiana*, a species described by Skean and Judd (1988) and the *P. microphylla* complex, which forms a group of closely related species/entities, that is in need of further taxonomic work (see below). Additionally, previously unidentified specimens (listed as *Pilea* sp. in Judd 1987) have been found to represent a new species, which is described below.

Pilea* aff. *microphylla (L.) Liebm.—W.S. Judd 3624 (FLAS); J.D. Skean, Jr. 1530 (EHH). These collections were reported under this name in Judd (1987). We note that they differ from the widespread and variable *P. microphylla* in lacking small axillary branches along the major stems and in having elongate cystoliths on the adaxial leaf surface that are arranged both longitudinally and transversely; typical material of *P. microphylla* has cysto-

liths that are exclusively transversely oriented (i.e., oriented at right angles to the leaf axis). These specimens are extremely succulent, while typical material of *P. microphylla* has leaves that vary from nearly herbaceous to extremely succulent. We also note that the leaves of these specimens are not spatulate, as in the phenetically similar *P. spathulifolia* Groult of the Sierra de Bahoruco, in the Dominican Republic (Groult 1999).

Voucher specimens: **HAITI. Département du Sud:** Massif de la Hotte, Macaya Biosphere Reserve, S slopes of Morne Formon, N of Ville Formon, 1670–1770 m, 25 Jan 1984, W.S. Judd 3624 (FLAS); S slopes of Morne Formon, along trail leading from the cirque to the ridge, 1525–1830 m, 11 Jun 1984, J.D. Skee, Jr. 1530 (EHH).

+ *Pilea vermicularis* Majure, Skee & Judd, sp. nov. (Fig. 3). TYPE: HAITI. DÉPARTEMENT DU SUD: Massif de la Hotte, Macaya Biosphere Reserve, extremely disturbed fields between Ville Formon and S slopes of Morne Formon, along trail leading to the cirque and above, along N-facing slopes SW of Ravine Seche, 1000–1220 m, 10 Jun 1984, J.D. Skee, Jr. 1500 (HOLOTYPE: FLAS!, ISOTYPES: FLAS!, NY!).

Species haec a *Pilea wulfschlaegelii* Urb. differ caulibus pubescentibus (non glabris). Pagina abaxiali foliorum sine hydathodes, et base acutata (non obtusata vel rotundata).

Shrubs, apparently dioecious, woody, to 60 cm tall, highly branched; indumentum of simple, \pm flattened, silvery, multicellular hairs; young stems rectangular in cross section with filiform cystoliths parallel to the stem axis 0.1–0.3 mm long, pubescent with clear, multicellular, uniseriate, ascending hairs to 0.3 mm long; stems becoming rounded in cross section and glabrous in age, 0.4–1.6 mm in diameter; leaves opposite, decussate, moderately anisophyllous, i.e., the smaller leaf $\frac{1}{2}$ to $\frac{3}{4}$ the size of the larger leaf, to isophyllous, $0.45\text{--}1.7 \times 0.25\text{--}0.9$ cm, ovate to elliptic, the apex acute, the base acute to obtuse, serrate along distal $\frac{2}{3}$ or more of the leaf margin, mostly entire at base, each serration with a single vein, glabrous on both surfaces or with sparse, multicellular hairs to 0.5 mm long on the primary vein of the abaxial leaf surface, 3-veined, but with secondary veins brochidodromous in distal portion of lamina, primary and secondary veins impressed adaxially and raised abaxially, veins on the abaxial leaf surface with conspicuous filiform cystoliths produced parallel to the vein axis, adaxial leaf surface covered in dense, conspicuous, oblong to filiform cystoliths $0.3\text{--}0.4 \times 0.05\text{--}0.1$ mm, produced in all directions (i.e., disorganized) and oftentimes overlapping, and becoming smaller toward the center of the lamina, abaxial leaf lamina with punctiform to filiform, inconspicuous cystoliths, petioles 0.9–5.5 mm long, pubescent on the adaxial surface, hairs erect to ascending, glabrous on the abaxial surface although with conspicuous punctate to elongate cystoliths; intrapetiolar stipules $1.3\text{--}2.8 \times 1.2\text{--}1.7$ mm, obovate to oblong, apices truncate, rounded or slightly 3-lobed, with conspicuous filiform cystoliths produced parallel to the axis on the abaxial surface; carpellate inflorescences red, producing \pm cymose clusters of flowers along the main axis, 0.6–1.2 cm long, 0.15–0.8 cm across, bracts $0.3\text{--}0.6 \times 0.05$ mm, ovate to obovate with apices acute, rounded or three-lobed as in the stipules; carpellate flowers with pedicels 0.3–0.4 mm long, tepals 3, dimorphic, the larger tepal saccate, 0.4–0.7 mm long, elliptic, forming a cup-shaped, fleshy structure enclosing gynoecium, its margins incurved, clasping, and membranous, apex 3-lobed, the central lobe succulent and exceeding the two membranous lateral lobes, the two lateral tepals 0.2–0.6 mm long, ovate to narrowly elliptic, with acute apices; ovary appearing unicarpellate, stigma penicellate, with elongated papillae; staminate flowers not seen; achenes elliptical, biconvex, brown, the surface moderately alveolate, $0.6\text{--}0.65 \times \text{ca. } 0.4$ mm.

Etymology.—The specific epithet *vermicularis* refers to the wormlike appearance resulting from the disorganized and oftentimes overlapping cystoliths on the adaxial leaf surface (Fig. 3D).

Putative relationships.—*Pilea vermicularis* is morphologically similar to *P. wulfschlaegelii* Urb. (Jamaica) and *P. radicans* (Sw.) Wedd. (both from Jamaica); all three species have “disorganized” cystoliths associated with the adaxial leaf surface, glabrous leaf surfaces, and serrate leaves. *Pilea vermicularis* differs from these species by its pubescent stems (Fig. 3B). *Pilea vermicularis* also differs from *P. wulfschlaegelii* by the lack of glands (hydathodes) on the lower leaf surface and the acute to obtuse vs. obtuse to rounded leaf bases (Fig. 3C, E, F). *Pilea vermicularis* differs from *P. radicans* by its frutescent habit (vs. vine-like habit in the latter). *Pilea vermicularis* is also similar to *P. rufescens* Fawc. & Rendle (Jamaica), although that species has densely pubescent leaves and reddish hairs on the stem, instead of glabrous leaves and silvery stem hairs. Morphologically, *P. vermicularis* appears to be closely related to Clade 2, Unit 5 of Monro (2006), sharing heteromorphic leaves

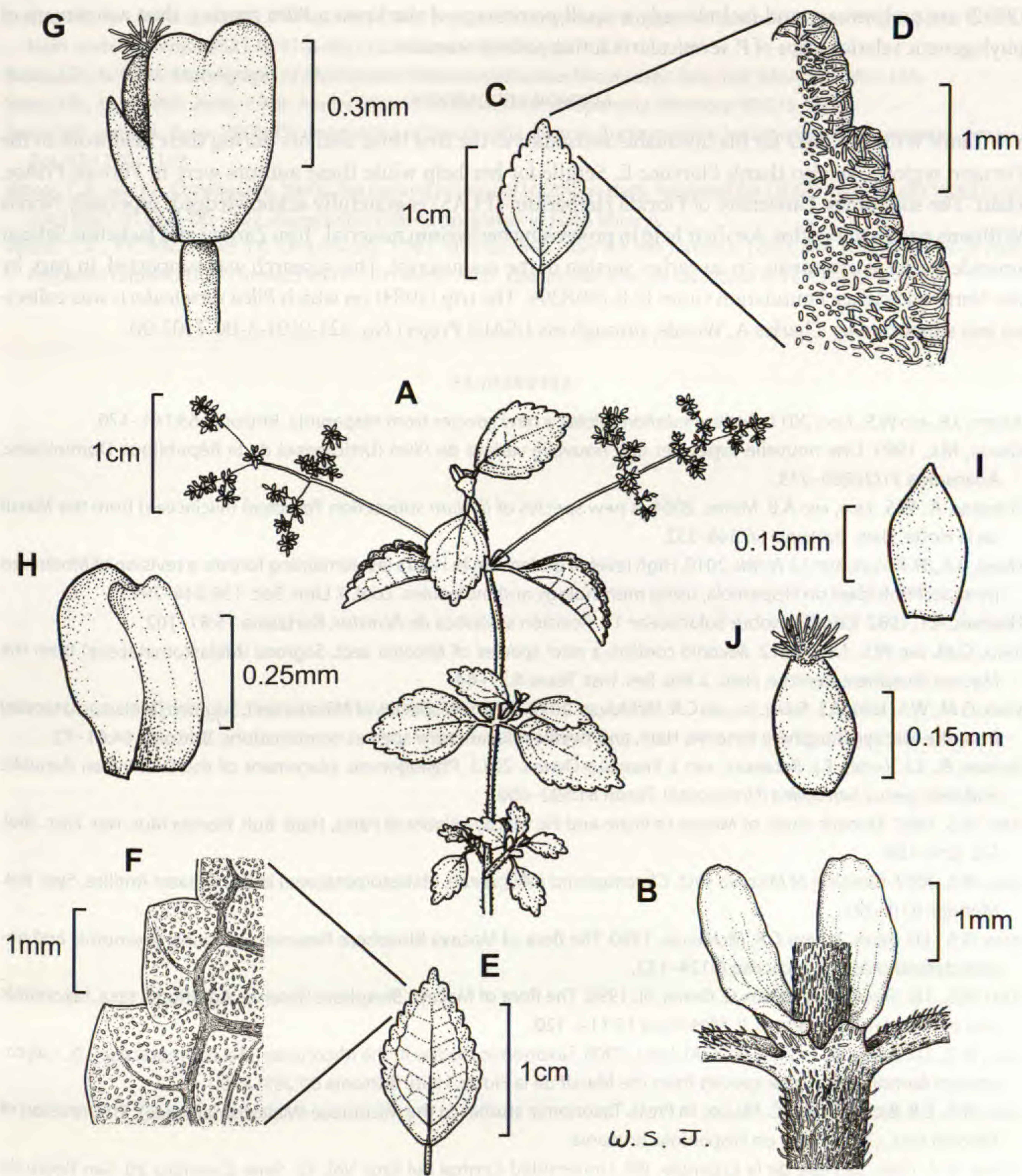


FIG. 3. Illustration of *Pilea vermicularis*. A) habit, B) close-up of stem and intrapetiolar stipules, C) leaf, adaxial surface, D) close-up of adaxial leaf surface, E) leaf, abaxial surface, F) close-up of abaxial leaf surface, G) carpellate flower, H) larger, saccate tepal, I) smaller, lateral tepal, J) achene.

with incised margins and 3-merous carpellate flowers (Fig. 3C, E, G). However, those taxa are known from Central America instead of the West Indies and are glabrous instead of pubescent. The West Indian subclade (Clade 2, Unit 4) contains pubescent species with isomorphic leaves with entire margins, and 3-merous carpellate flowers (Monro 2006; see also “Clade H” in Jestrow et al. 2012). *Pilea vermicularis* may belong to this group if leaf margins are not consistent throughout the clade. Members of this clade occur in the Parc National Pic Macaya (e.g., *P. domingensis* Urb.; Judd 1987). The phylogenetic analyses of Monro (2006) and Jestrow et al.

(2012) are preliminary and include only a small percentage of the known *Pilea* species, thus assessment of phylogenetic relationships of *P. vermicularis* at this point is tentative.

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